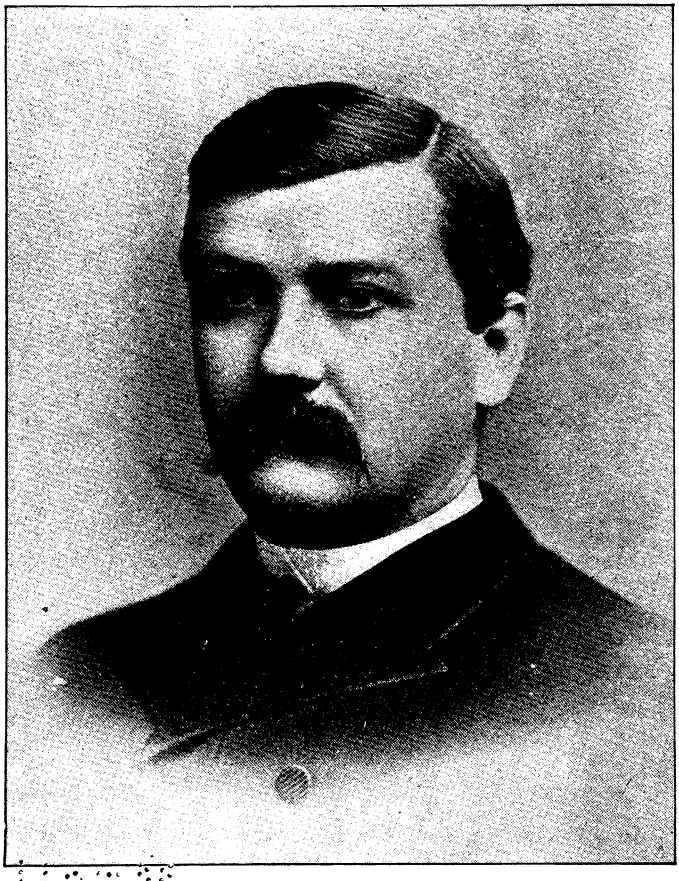

A. W. HARLAN, M. D., D. D. S.

EDITOR THE DENTAL REVIEW.

ITEMS OF INTEREST.

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Shots from the Profession.

MY EXPERIENCE WITH THE DENTAL PULP.

DR. WM. A. PEASE, DAYTON, O.

[Read before the Mississippi Valley Dental Association, held at Cincinnati, O.]

More than fifty years ago, when I became a dentist, it was the practice when we wished to insert a pivot tooth, now called a crown, and when the pulp became exposed, to destroy it by thrusting a properly prepared hickory splint, or oftener, a flexible steel instrument as deeply into it as it would go, turn it rapidly around and therewith excise the pulp. It was also the custom when necessary to destroy the pulp before plugging, to open the cavity, especially on the proximal face, and then use a hickory splint in the same way, but oftener a piece of East India bamboo, sawed off at each joint, was split off the required size, properly fitted, often soaked in water a few minutes to make it more tough and flexible, always leaving the outside of the bamboo uncut, as being the least liable to break, and always in a proximate cavity turning that toward the back side before thrusting it down. It was a barbarous practice tempered with a full equivalent of mercy, as there were no afterclaps, no troublesome flux to that point, causing tumefaction, a signal that nature had been outraged, to end when she had established a natural drainage-tube, and an interrupted series of tumefactions and paroxyisms of pain. All of these were then unknown; people enjoyed their pivot teeth; often fastened by a pivot of bamboo, the outside never removed, and that always placed on the lingual face of the root as being the least liable to break. They were fully as enduring as the more complicated crowns of to-day, and then getting a fee that enabled us to adjust the crown to the root, and obliged to make many of our instruments, we brought to it much manual and artistic skill. They were nearly, and often fully, as cleanly as the crowns of to-day, for the modern crown resting on an intervening phosphatic layer, are often sprung soon after insertion enough to admit uncleanliness. Fitted as they were then, with the modern intervening layer of phosphates, I have no hesitancy in saying they would be more enduring than the average crowns as now used, and vastly easier to

replace in case of an accident. I have positive knowledge that many crowns I inserted lasted more than twenty years; but these were subsequent and are mentioned only to show that careful manipulation under the old methods produced good results. Then everything was secret; there were no dental journals nor colleges; every practitioner guarded his methods, many of them elaborated from his inner consciousness, and it was not long before I discovered that others had modes of practice in some respects superior to mine, which were so valuable they would not part with them for love nor money. In vain I tried to fill teeth, held in a vise, equal to theirs. Their methods I must have, so I dug out one of my own filling, went and found my superior who was very inquisitive and ignorant, and very nervous, made him explain his method, show his instruments to see if there was hurt in them, and at last in the chair, I held his hand mirror and saw his operation. This was several times repeated with others. Once I met subsequently one of them at a dental meeting, and when introduced watched to see any sign of recognition, but he had a polite control over tongue and face, or he did not recollect me.

It was some time before I learned the use of arsenious acid. Then the pulps were deadened, but not removed; they, with whatever arsenic they had absorbed, were sealed in, and so far as I now recollect the percentage of ulcerations was not materially greater than in the average complicated operations of to-day; but they were greater than where the pulp was destroyed by mechanical means and immediately removed to set a crown. Well do I remember the first complaint that an incisor tooth had become pink. There it was, immediately over the pulp, as near as the two different structures would admit, a bony ecchymosis; but I soon found if the cavity was opened and the pulp removed the color disappeared.

It was some years later that Dr. Solyman Brown published, in an illustrated article in the first American dental journal, his mode of practice. That journal cost one dollar and a quarter a number. I have it yet; it cost to get modes of practice then, and he was censured for giving the secret away. From the beginning there were teeth suitable for a crown, in which the nerve was dead. After these had been cut down and drilled, there was little space left for germs; but it was the custom to run a smaller drill further down to make them less offensive; into which a little cotton dipt in wood creasote was placed, and when the pivot was thrust in, a part was prest through the foramen. It should be remembered that the creasote of commerce and carbolic acid are quite modern. I still keep wood creasote by me; coming down to modern practice I have tried the various remedies or germicidal root dressings, but still think the one I have used for several years the best,

the formula of which is: Iodide of potassium, 1 oz; aqua, 1 oz. After an offensive tooth has been prepared and the nerve canal opened as far as practical, a broach may be pushed down, the dam being on, or other means employed to keep the cavity from being flooded, when a drop of that solution may be placed in an inferior tooth, and almost instantly the patient will start from a slight pain, the fluid having passed the foramen. Here a pretty strong solution of iodide and potash as limpid and clear as water, passes without trouble through the entire canal and is absorbed by capillary attraction into the empty spaces of the fibrils into the cement, and if the buccal roots of the superior molars are opened as far as convenient and a little cotton wet with it is prest in, and an instrument a little larger than the cavity is prest on it, most of the canals will be filled either by pressure or absorption. In addition to this, if desired, carbolic acid or the nasty and offensive smelling iodoform can be used. In regard to iodoform, if confined with a cork it is apt to shrink, and the iodine to evaporate and to be of very uncertain strength, while a solution of potash and iodine loses little or nothing. Much more might be said in favor of this, how the potash unites with animal matter, and iodine stimulates the absorbent.

Thus far the salient points in the treatment of the dental pulp and its remains have been noticed; a few words as to the modern treatment must suffice. This may be divided into two parts: When the pulp has been suddenly and unexpectedly exposed in operating, and where it has been encroached on by disease till it has become irritable, and has ached occasionally.

My first departure was for a young lady æt. 16, whose sixth year molar was aching and had occasionally ached before—crown cavity, no periosteal complication. The cavity was prepared, point of exposure located; means adopted to prevent flooding, when a drop of wood creasote was placed on the spot, then a suitable quantity of chalk was carefully placed over the point of exposure, a cap of tea-lead placed on that, and the cavity filled with amalgam, and the pain ceased, and for several years there was no recurrence. My present practice is to touch the point of exposure with a little of an eight per cent of cocaine; wait till it begins to take effect, then place on that a little morphine in substance and finish as before. The cocaine subdues irritation for an indefinite time, and the more persistent morphine quiets it for weeks. Both are strong remedies and must be used with caution,* the cocaine being a non-irritant. It has always seemed unphilosophical to me to use an irritant on so sensitive a tissue as the dental pulp. Prepared chalk comes the nearest to my ideal of any substance, a non-

*Success will be more uniform without the morphine.—ED. ITEMS.

conductor, non-irritant; merely homogeneous with the walls of the tooth, it is better in many respects than the same quality of phosphate of lime. It is sometimes a little difficult to adapt to a proximal cavity. My method is this: Prepare cavity and locate point to be capt; touch that with a little eight per cent cocaine, keep otherwise dry, then cut a piece of tea-lead to suit the place, take a piece of bleached shellac, warm a globe ended instrument, press it on the lead and the gum will adhere to it; moisten the place with cocaine or a little carbolic acid so the chalk will adhere to it and be a little pasty, then touch a warm instrument to the place over the gum under the lead and it will adhere if the tooth is dry, then press very lightly the edges of the lead to the walls of the cavity, when the tooth may be filled with amalgam, or the cap can be covered with phosphate and filled with gold. Sometimes it will be more convenient to apply the paste to the spot with a delicate spatula and then cover with the lead, the space between the teeth being small. When a large cavity is to be filled with gold, phosphate, or better still amalgam, it should be filled over the cap and prest thoroughly to the walls and base, except over the point of exposure, where it should be lightly touched, or arched. If filled wholly with amalgam then the chalk will not yield under pressure, and the filling settle and leak. I have become so accustomed to this practice that I take great risks.—*O. J. Den. Science.*

ANCIENT BRIDGE WORK.

DR. M. BISSELL, CAMDEN, S. C.

In July ITEMS OF INTEREST I have read the article of Dr. W. H. Hart, on "Crown and Bridge Work," with interest. It is a style of work I used over fifty years since; but within the past few years it has been *patented*, as being "*a new and useful discovery.*" The cuts of Dr. Hart's article are from "The Surgeon and Dentist," published in 1829 by Dr. S. S. Fitch, then in practice in Philadelphia. The book is an old acquaintance of mine, being one of the early works on dentistry I read, after Hunter and Fox.

That style of dental work was frequently used in my early years of practice, a half-century since. Having been "*laid up in ordinary*" for several years, I had not met with many cases of crown and bridge work of the new departure till lately. I was under the impression that the work was more elaborate than the specimens I now see. I am a little surprised that a patent could have been granted for a style of work in use so long ago in the offices of many dentists of the old regime, though not as far back as "when the world was in its prime," or John Hunter's case, or that referred to by Dr. Burnet. It seems to

be the rule of the patent office: "You pays your money and take your document; no questions asked."

Several of the cuts given by Dr. Hart are similar to the works I executed in my early years of practice, with and without clasps. The teeth then in use were the human and animal teeth, and blocks of the sea horse. Sometimes they were mounted on a base of ivory, or on gold or silver plate. In the latter part of 1828 I commenced to make mineral teeth in the office of Dr. C. Starr Brewster, No. 5 Park place, New York. For some two or three years these were the only ones in use; but they did not compare with those given the profession a few years after, though they were an advance on the shapeless French teeth.

My earliest reading in the profession, in the decade of twenty, was a treatise on dental surgery by Dr. E. Gedney, a dentist in Utica, N. Y. That work, during my early years of labor in "the art of all arts that unfetters the soul," I assisted in putting in type; and I worked off, on an old Ramage press, the first and probably the only edition. From my recolletions of the work, coupled with my after experience in practice, it was not considered a masterly effort; but the doctor became in later years a master workman in the profession in Manchester, England.

While jotting down the doings of the days of old, I may refer to my very earliest operation in the profession, but not of much interest. While a boy in a physician's office in Utica, a lad, the "herald of a noisy world" from a printing office, generally known as the "devil," called to have a tooth extracted. Finding the doctor absent, my young friend asked me to remove the tooth. I had never extracted a tooth, though I had seen many drawn; but finding "Barkis was willing," I applied the turnkey, and was successful, to the satisfaction of my patient and to my self-importance.

Among the "new departures" causing some controversy is the use of tin and gold foil combined in the same cavity. It has given rise to some discussion in the dental journals, both as to the utility and the priority of the use of the materials combined. In 1832, in my practice, I combined the two metals in tooth cavities, and am not aware of any detriment occurring then or since in their use. In 1832 I met an English gentleman who had a tooth filled in London several years before with tin and gold. Though the filling was *dark*, it had done good service for a number of years. The discoloration may have been caused from the tin then in use not being as pure as now.

When the thoughts wander back through the vista of time, what visions of old pass before it! especially when the past and the present, the *then* and the *now*, of our profession comes in view. The changes in the practice of the profession are as thick as "leaves in vale ambrosia;"

but the end is not yet. The spirit of improvement in all the departments of the profession is abroad; and men well qualified to accomplish the desired end are up and doing. In their vocabulary there is no such word as "fail." I have witnessed many advances in my professional years. If I am to see many more, they must come quickly; for though it may not be said of me "he is sans teeth, sans eyes, sans hair, sans everything," I am at the close of my eighty-fourth year of probation. Yet I may say, with David Crockett, I can jump higher, squat lower, dive deeper, and come out as dry as any other man in the county of Kershaw. Excuse an old man's loquacity and failing vision.

PROMISCUOUS EXTRACTION.

DR. W. H. ATKINSON.

[Extract of Address before the Indiana Dental College.]

By reason of a technicality and squeamishness all distinct knowledge of teeth other than that they were the source of much suffering found little mention in anatomical works in English till Goodsir, of England, took on himself deeper investigations into the origin and significance of these organs. It is no wonder then that the practice of dentistry so long principally consisted in the extraction of teeth. It was common for graduates in medicine, previous to the last thirty years, to ignore the teeth as undeserving of other than extirpative treatment, and of course the families under their advisement have followed their lead till artificial substitutes in the younger States became almost a universal necessity. Within twenty-five years the wide-spread destruction of teeth in Indiana, Illinois and other Western States was so great as to present numerous examples of mothers in their teens with entire dentures of artificial construction, sometimes on the upper jaw alone, but frequently involving both jaws. The practice of parapetetic tooth extractors travelling from house to house and ruthlessly removing the teeth from all whom they could persuade to submit to their treatment was followed by others in a short time who inserted teeth that "would never ache," according to the statement of the learned dentist. This practice prevailed not only in by-places where there were no religious teachers or limbs of the law, but directly under the noses and in the families of the so-called scholarly professions, and it is painful to add that the medical fraternity cannot be exculpated from a like indifference to the well-being of the mouths of the patients for whose general maladies they were continually prescribing. In fact, it is more difficult to meet the views of patients assuming a knowledge of their teeth they do not possess than those who have simply learned that there is great advantage derived from employing the dentist. As a rule the majority of patients to this day think that if they can preserve their front teeth so as to be presentable in looks that this should limit their effort at preservation.—*Dental Register.*

DISCOLORATION OF AMALGAMS.

Editor ITEMS:—Permit me to correct a statement made in your last issue. I have never said or believed that the discoloration of an amalgam was caused by oxidation, nor can I find any such statement as you refer to. Those people who believe the discoloration is caused by an oxide are the same who "wisely" attempt to dissolve the "oxide" with spirit, ammonia, soda, etc., and who appear to think they have performed a great chemical feat if they can get a little dirtiness in the liquid. Filings for amalgams take up sulphur readily, forming a strongly adhesive sulphide which does not combine with mercury and which comes off and discolors the hand in mixing; but any quantity which is likely to form can have no appreciable effect on either the color or the permanence of an amalgam. The discoloration in the mouth depends largely, in fact almost entirely, on the surface of the amalgam which, if packed as firmly as possible, using tin foil to absorb the superfluous mercury, will not discolor if once properly polished; though the same alloy, if left dull and badly finished, will become black in a short time. THOMAS FLETCHER.

Warrington, England.

EDITORIAL REMARKS.

Of course we accept our English friend's statement that he has "never said or believed that the discoloration of an amalgam was caused by oxidation, nor can I find any such statement as you refer to." And yet in the light of this denial we are unable to interpret what he says in our July ITEMS, and to which we referred in our editorial in the same number. It seems to refer to oxidation as the cause of the discoloration of amalgam. He says:

"I have been waiting for twenty-five years to learn why any one, either with or without a knowledge of chemistry, uses ordinary washing soda to wash away oxides of metals, and still wait; many seem to look on oxidized amalgam and dirty clothes as chemically alike and requiring the same treatment. If amalgam is oxidized it has been neglected and treated in a manner which renders it unfit for use, and it cannot be washed at all till at least double the necessary quantity of mercury has been added."

Dr. Fletcher now explains that it is sulphur accumulating on the surface of the alloy that causes discoloration. He says:

"Filings for amalgam take up sulphur readily, which does not combine with mercury, which comes off and discolors the hand in mixing."

But does this explain how it is that amalgam filed from that just taken from the melting pot discolors the hand in mixing? The filings have had no time to take on sulphur. How is it, then, that sulphur "comes off and discolors the hand?"

HOW TO AVOID INDIGESTION OR DYSPEPSIA.

Editorial in *Dental Headlight.*

Of prime importance is the thorough mastication of food. This can only be accomplished by those who possess a good denture. See to it that the teeth and gums are in a healthy condition, and keep them so by regular cleansing. It is essential that the food shall be reduced to a comminuted state—a pultaceous mass—that the solvent and chemical action of the several digestive fluids may be efficient. A chemist first pulverizes solid substances before he subjects them to the action of the solvent menstruum. But in animals, digestion consists not only in reducing the food to a state of solution, but chemico-vital changes are effected by the digestive ferments contained in the various secretions which are found in the alimentary canal. Hence it will not do to substitute these important fluids with water or other liquids. Take for example the saliva, which is so often substituted by other fluids, and so lavishly wasted by the average American.

Without discussing the well recognized solvent and diluent properties of the saliva, let us call attention to its other offices.

1. The saliva being an alkaline fluid, in accordance with the conclusion of physiological chemists, is the normal excitant to the secretion of the acid gastric juice. An alkaline substance applied to the mouths of acid secreting glands promotes their functional activity. The converse of this is true also.

2. The saliva possesses the power of aerating our food. By virtue of its viscid, frothy character it is endowed with the remarkable property of imprisoning innumerable globules of air, which are incorporated with the food during the process of mastication. Thus rendered porous, the food is readily permeated by the digestive secretions and its subsequent solution greatly facilitated.

3. By lubricating the dental and oral surfaces with its viscid coating, the adhesion of tenacious substances is prevented, and the food glides smoothly through the pharynx and esophagus into the stomach.

4. The saliva keeps the mucous lining of the mouth and tongue continually moistened; this condition is requisite to proper phonation and distinct articulation.

5. Taste is dependent on a sufficient supply of saliva. By solution in the saliva, the sapient elements of food are absorbed and brought in contact with the terminal filaments of the gustatory nerves. Substances insoluble in the saliva are devoid of taste.

6. The renewal of the air within the cavity of the tympanum is effected by the swallowing of a small amount of saliva. This phenomenon occurs at regular intervals, even during sleep.

From a late number of the *Medical Record* we extract the following, which still further demonstrates the importance of the saliva :

"Dr. George Sticker, who, in conjunction with Dr. Curt Hubner, has made some experimental studies on the physiology of the secretions, has recently published an article in which still more is claimed for the saliva than a purely amyloltic power. He believes this secretion taken into the stomach assists in the formation and secretion of pepsin, and thus indirectly assists in proteid digestion. A suspension of salivary secretion largely suspends peptic secretion also. He cites the case of a woman who suffered from an almost complete suspension of the salivary function.

"There was indigestion of both meats and carbohydrates. The re-establishment of the salivary flow by means of infusion of jaborandi relieved the stomach trouble also."

It is evident from the foregoing that many cases of indigestion are dependent on a failure to utilize this secretion. Mastication is the chief excitant of the salivary glands, the amount of saliva poured forth, and its incorporation with the food is determined by the thoroughness with which this process is performed.

Digestion is retarded by very cold or hot solids or fluids into the stomach. Digestion requires a temperature of about 100° F. for its proper performance. Many suffer during the summer season with a form of indigestion commonly known as "ice water dyspepsia." The ingestion of hot bread or other hot food is also equally deleterious. The process of digestion ceases till the contents of the stomach regain its normal temperature. The consumption of an excess of food or drinks, or an insufficient quantity, as regards bulk, are also potent factors in causing dyspepsia. Over distension paralizes the muscular walls of the stomach, whereas a lack of sufficient bulk, by a failure to excite muscular movements, is productive of atony. The peristaltic movements of the stomach, by bringing the food in contact with all parts of its secretory surface, and by its churning or triturative action on the food, materially assists in the digestive process.

Many dyspeptics make the mistake of eating but little food, and that of a highly concentrated character, being ignorant of the fact that a sufficient bulk is required to excite those muscular movements of the stomach and intestines on which good digestion is largely dependent. Others are slaves to appetite often insatiable; eating ravenously, notwithstanding the remonstrances of an already overloaded stomach. They consume food, not because the system demands it, but to satisfy a pampered taste; even resorting to condiments and stimulants to goad the already overladen and overworked stomach. No wonder they are, sooner or later, ready to say with an eminent writer, "I was a happy man till one day I realized I had a diabolical contrivance called the stomach." Till the vital organs become the victims of disease we are fortunately not conscious, by our subjective sensations at least, of their existence.

AN ANESTHETIC CASE IN PRACTICE.

J. W. JAY, M.D., D D.S., RICHMOND, IND.

[Read before the Mississippi Valley Dental Association.]

On the tenth of last November, a lady came into my office and asked me if I could extract a tooth for her. I told her I thought I could. She then informed me that Dr. Kelsey, one of the prominent young physicians, would be in presently to administer ether to her. He soon came, and she took her seat in the chair. In appearance, she was a lady in possession of rather more than ordinary health, and I should think would weigh about 130 pounds. Placing the chair at an angle of about 45 degrees, and supposing the doctor had made all the necessary examinations, in regard to her health at their previous interview, I asked her no questions. On examining her mouth, I found two teeth to remove instead of one, and told the doctor I was ready. He immediately began the administration of the ether, and in just three minutes from the first inhalation, the teeth were out, extracted while she was under the primary effects of the ether. Still retaining my position by her side, and Dr. Kelsey standing in front of the chair, both of us expected, of course, that in a few minutes, at the farthest, she would open her eyes and show symptoms of returning consciousness. But in this we were doomed to disappointmrnt. Up to this point her breathing was natural and pulse normal. Very soon, however, to our dismay, her breathing grew shorter and shorter, and then ceased. I sprang to her and began the process of artificial respiration, by standing behind the chair and a little above her, and placing my hands, one below each of her breasts, at the margin of the short ribs, and pressing upward, and then relaxing the pressure, alternately. Keeping up this process for a few seconds without any appreciable benefit, the doctor hurriedly suggested that we lay her on the floor, and we lost no time in complying with his suggestion. As soon as she was in this position, the doctor proceeded with the artificial respiration without any apparent improvement. Her eyes were closed from the start, and she was as limp as a rag, and her countenance by this time had assumed the livid hue of death. We saw at once that something must be done, and done quickly. So I gathered her by the legs and lifted her up, her head hanging down, and her legs resting one on each of my shoulders. All this time she had not breathed once, and I distinctly remember of wondering to myself how it could be possible for any one to be so long without drawing a single breath and live, for it seemed to me an age; therefore, I said to the doctor, it is no use, she is dead.

He placed his ear to her chest; said her heart still beats. "Then," said I, "We will work as long as the heart continues to act." At this crit-

ical moment she showed manifestations of returning life by a feeble respiration accompanied with a suppressed groan; and at a long intervals another, and then another. I held her in the inverted position till her breathing seemed to be thoroughly established, which produced a sense of relief to us both, more easily imagined than described. We placed her again in a horizontal position on the floor, and, of course, thought that now she surely was all right. The doctor exclaimed, "My God, that is the closest call I ever had."

But how soon were our cherished hopes frustrated. In a few seconds after we had laid her down, we had a repetition of the same condition. I took her again by the legs and held her in an inverted position as before. This time we were sure that she had gone to that "bourne whence no traveler ever returns." But, by good luck, combined with our efforts, the doctor doing what he could at artificial respiration, fortune once more smiled on us and she breathed again with a groan, and a second time. We breathed easier, with the hope that surely this is a permanent return, and we again laid her on the floor. But how were we startled soon after to see her relapse into a state of stupor, apparently more profound than ever before. This time the doctor laid her breast bare by taking hold of her collar and dress, under her chin, making the buttons fly in every direction. He gave her hypodermic injections of whiskey, and applied cloths wrung out of cold water to her breast, without effect. She lay there, seemingly, as lifeless as a corpse. By this time I felt considerably played out. A strong man from the country, who had just come in to have some work done, was sitting by, looking on with all his might. I asked him to take her up as I had done, to which he readily consented, and held her in an inverted position as before till her breathing was restored, when she was again placed on the floor. Suffice it to say, the inverting process was resorted to the sixth time before continued respiration was restored. When this was accomplished we laid her on a lounge, and her respiration being quite feeble, the doctor gave her two or three more hypodermic injections of whiskey. The heart's action also being very feeble, he sent out and obtained some nitrite of amyl, and had her inhale a portion, with very happy effect. During the whole time we kept watch of her tongue and saw that it did not drop down her throat and rest on the epiglottis and thereby produce strangulation. It was at least twenty minutes after she began breathing regularly, before she showed the least evidence of returning consciousness. Observing the clock, I discovered that it had been about an hour since the doctor began the administration of the ether.

Nothing further occurred, in reference to the case, to mar our expectations of a speedy recovery, and right glad were we when we felt

assured that a restoration was at hand. She commenced taking the ether at a few minutes after 2 P.M., and a little after 5 P.M. she walked home, a distance of five or six squares. Squibb's ether was used and less than three ounces given, and from a can opened then for the first time in my presence.

There is an exceedingly interesting account of a case called "Sims' Case," related by J. Marion Sims himself, in a paper read before the British Medical Association, of the syncope and resuscitation of the patient. He was operating on a French countess—young, beautiful, accomplished—for vesico-vaginal fistula, the result of her first accouchement. The account is extracted from his paper, and given in vol. III, page 125, of the *American System of Dentistry*, by Dr. Litch in his able and exhaustive paper on "Anesthesia and Anesthetics," which will richly repay any man to read.

In Sims' case, chloroform was given instead of ether. But to all appearance, the syncope, as the result of anesthesia, was the same, and in the treatment of our patient we endeavored to follow the same course adopted in Sims' case, as the great Nelaton said, who was standing by watching and giving orders on that occasion, "Certainly, there is nothing else to do."

About two weeks previous to our experience with this lady, Dr. Band, one of the prominent physicians of this city, had a similar experience with her in the office of Dr. Hamilton, one of my neighboring dentists. This time she had but one tooth extracted. After an hour or more of vigorous effort on the part of the two doctors, she came out all right. When she was fully restored, they very emphatically endeavored to impress her with the fact that she was not an acceptable subject for the action of ether, and for her never to attempt to take it again under any circumstances, reminding her, that if she did, in all human probability, she would wake up in another state of existence. She gave neither Dr. Kelsey or myself the least intimation of the advice and caution that they had given her. If she had, she would have met with a prompt refusal.—*O. J. Den. Science.*

Packing Amalgam.—I consider the use of bibulous paper in the condensing of amalgam a very valuable suggestion. Indeed, I do not think there is any method by which it can be packed or condensed with so much certainty. The use of the paper under the instrument prevents any part of the mass from sliding or spilling from the cavity when the force is used, and it also brings any excess of mercury to the surface, from whence it may easily be scraped away and the filling left quite hard and dry. It is my understanding that Dr. Bonwill was the first to suggest this method of condensing amalgam.—BENJ. LORD.

STEEL, ITS HISTORY AND USES.

DR. C. F. HARTT, CHICAGO.

The kind of steel we will speak of was used by the early Greeks, and may have possibly been known in Egypt, though this is doubtful. The old Romans were familiar with the manufacture of steel.

Many bodies which are capable of undergoing ignition are rendered hard and brittle by sudden cooling. Glass, cast iron and steel are the most remarkably affected by this circumstance, the inconveniences arising from which are obviated by cooling them very gradually; and this process is called annealing.

Steel is most effectually annealed by making it red hot in a charcoal fire, which must completely cover it, and it should be allowed to go out of its own accord.

Steel is made of the purest malleable iron, by a process called cementation. In this operation layers of bars of malleable iron and layers of charcoal are placed one on another in a proper furnace, the air is excluded, the fire raised to a proper degree of intensity, and kept up for eight or ten days; if, on the trial of a bar, the whole substance is converted into steel, the fire is extinguished, and the whole is left to cool for six or eight days.

Iron thus prepared is called blistered steel, from the blisters which appear on its surface.

Duame found an advantage in using from one-fourth to one-third of wood ashes, especially when the iron was not of so good quality as to produce steel possessing tenacity as well as hardness; these ashes prevent the steel from being effected so rapidly as it would otherwise be, and gives to the steel pliability without diminishing its hardness. The blisters on the surface of the steel under this management are smaller and more numerous. He also found that if the bars, when they are put into the furnace, be sprinkled with salt, this ingredient contributes to give body to the steel.

If the cementation be continued too long, the steel becomes porous, brittle, of a darker fracture, more fusible, and capable of being welded.

Steel cemented with earthy infusible powders is gradually reduced to the state of forged iron again. Excessive or repeated heating is attended with the same effect.

The properties of iron are remarkably changed by cementation; it acquires a small addition to its weight, which consists of the carbon it has absorbed from the charcoal, and amounts to about the hundred and fiftieth or two hundredth part. It is much more brittle and fusible than before, and it may still be welded like bar-iron, if it has not been fused or over cemented; but by far the most important alteration

in its properties is that it can be hardened or softened at pleasure. If it be made red hot and instantly cooled, it attains a degree of hardness which is sufficient to cut almost any other substance; but if heated and cooled gradually it becomes nearly as soft as pure iron.

A rod of good steel in its hardest state possesses so little tenacity that it may be broken almost as easily as a rod of glass. This brittleness can only be diminished by diminishing its hardness; and in the proper management of this point for different purposes consists the art of tempering.

The colors which necessarily appear on the surface of the steel, slowly heated, are yellowish-white, yellow, or straw color, gold, brown, purple, violet, and deep blue. These signs direct the artist in reducing the hardness of steel to any particular standard, and when the desired color is reached the piece should be instantly plunged into cold water.

The yellowish-white indicates a temper so little reduced as to be used for edge tools; the yellow or straw color, the gold color, and the brown are used for razors, pen-knives, excavators, etc.; the purple, for tools used in working on metals; the violet, for springs, clamps, matrices, etc.; but if the last blue be waited for, the hardness will scarcely exceed that of iron.

When soft steel is heated to any of these colors and then plunged into water, it does not acquire nearly so great a degree of hardness as if previously made quite hard and then reduced by tempering. The degree of ignition required to harden steel is red heat. The texture of steel is rendered uniform by fusion. The tenacity of steel hammered at a lower heat, or even when cold, is considerably increased.

Various methods of hardening steel are resorted to, such as dipping in oil, tallow, and salt water; but when steel is required to possess the greatest degree of hardness, it may be plunged in mercury, which will render it so hard as to cut glass like a diamond.

The surest method for selecting steel for edge tools is to have one end of the bar drawn out under a low heat, such as to obscure red, and then to plunge it suddenly at this heat into pure cold water. If it prove hard and requires a great force to break it, whatever its fracture may be it is good, the excellence of steel being always proportionate to the degree of its tenacity in its hard state.

In general a neat curved line fracture, and even gray texture, denote good steel, and the appearance of threads, cracks, or brilliant specks is a proof of the contrary. If diluted nitrous acid be applied to the surface of steel previously brightened, it immediately produces a black spot; but if applied to iron in like manner, the metal remains clear. By this means it will be easy to select such pieces of iron or

steel as possess the greatest degree of uniformity, as the smallest vein of either on the surface will be distinguished by its peculiar sign. There are quite a number of methods by which steel may be manufactured, tempered, and annealed. At the present very little attention is paid to the colors which appear on the surface of the steel, as metal baths of a known degree of heat are now used; also, small and sharp-pointed instruments are best tempered or annealed by first enveloping them in a box of platina, or some other metal or earthy covering which will prevent burning and scaling, which would otherwise occur if allowed to come in contact with the air; and if the dentist will bear in mind a few of the simple facts herein stated, he may expect to meet with a reasonable amount of success when doing amateur work in his own laboratory.—*Dental Review.*

ELECTRICITY IN THE MOUTH.

DR. S. B. PALMER, SYRACUSE.

Dr. Watt writes thus: "When two metals are placed in the mouth and one is corroded by the buccal fluid, if they are not in contact, and if there is no better conductor connecting them than the fluid itself, the metals assume opposite electric states, but no current is established and decomposition of the fluid does not take place. This condition is static electricity. But if the metals touch each other, or both touch the mucous membrane of the mouth, a regular circle is developed and decomposition occurs in proportion to the quantity of galvanism thus set in motion. A gold plug and one of any base metal may constitute such a battery, and let us suppose these plugs are in adjacent teeth and in contact with each other—at a given point, or both in contact with the gums at the neck of the teeth—the binary compounds in buccal fluid must be decomposed, but how? Water and soluble chlorides are present in all mouths. Then, of water, the oxygen; and of the salts, the chlorine, go to the base metal, and the hydrogen of the water and the metals of the chlorides go to the gold. But we have already seen that nascent chlorine takes hydrogen from compounds containing it, hence hydrochloric acid must be formed at the base metal, and this is why we so often see the most common variety of dental caries about the margins of base metal plugs, this decay being the result of the action of hydrochloric acid. "When hydrogen reaches the gold it takes chlorine from compounds containing it, as promptly as itself is captured by the chlorine at the other side of the battery. But by this combination we have hydrochloric acid again, and this is why we so often find the same variety of decay around the gold filling. At the other side much of the force of the chlorine, as well as the acid, is spent in corroding the base metals,

while neither the hydrogen nor the acid can attack the gold; but all the force of the acid is spent on the tooth, and thus the tooth with the gold plug is, in such cases, more corroded than that with the base metal, which leads some to the conclusion that the base metal is the better filling."

Practically, there are many things to be considered in relation to the use of adjacent fillings—when and how to use them—but we confine the argument to principles which are well defined in the quotation just read. From the introduction of this theory up to the present time it has been our object to discover chemical laws on which to scientifically base our diagnosis, to secure more uniform results.

The filling materials referred to in explanation of the principles are gold, tin and guttta-percha; because gold and tin are simple elements; gutta-percha, by reason of its non-conducting properties, becomes practically so. Compound materials, though subject to the same law, so modify conditions that any attempt at explanation would only lead to confusion.

Amalgam is a compound. It has generally been discussed in connection with the electro-chemical theory on a comparative or practical basis, which fails to answer why in some cases amalgam preserves teeth better than gold, and in others quite the reverse; why the most perfect amalgam plugs dark colored on the surface next the dentine; why amalgam plugs in the crowns of molars wear convex, while tin, if not all other materials, wear concave. We must look to chemistry for the solution.

First, amalgams greatly differ in their chemical combinations. I will not say what science may do in producing materials which by mixing will form a chemically combined alloy. We only speak of amalgam as generally used. No one believes that amalgam plugs are alloys chemically combined like the melting together of copper and zinc, lead and tin. If so, let them corrode a polished surface of amalgam with acid, and examine the effects with a glass; or, better still, wet a surface with acid and slowly trace it with a fine platina point connected with a galvanometer. The needle reveals the fact that the surface, though apparently smooth, is a plain of numberless currents of positive and negative electricity. Allowing that the alloy before mixing is chemically perfect, the mercury does not so combine with the alloy. All of the ordinary amalgams contain two elements of a battery; the addition of a corroding fluid, like saliva, completes the arrangement, and sets it at work.

The walls of any cavity in a tooth are damp enough to tarnish the surface of an amalgam plug in contact, which, however, does no harm, provided the surrounding margins are tight, so as to cut off fresh sup-

plies of moisture to be decomposed ; for back of supplies the action at first started ceases, as a fire dies out for want of oxygen. This is why amalgam preserves the better class of teeth the same as gold. It answers even better in another class, namely, teeth that contain an excess of organic substance. As before mentioned, these are conductors with gold in contact, and, unless the margins are perfect, chemical action continues. With amalgam the metallic compound disengaged from the plug by chemical action enters into the organic substance, thus bringing the two elements to the same potential. In speaking of a battery we would say the copper has coated the zinc, and the current ceased. This principle applies to certain conditions within its sphere of action and may be relied on, but much harm is done in the effort to make it universal. It cannot be trusted to arrest decay in unexcavated fissures, to compensate for excessive shrinkage, or even to fossilize decayed organic matter. It should be remembered that amalgam is next to gold as a conductor, consequently it acts accordingly on the dentine. It has an advantage over gold in cases just mentioned, but when the plug fails to arrest decay by any of these means, it has within itself the elements of its own decomposition as well as that of the walls surrounding it. The abrasion of amalgam is slight on account of its hardness, while with tin which is softer it is considerable. This, however, does not account for the fact that amalgam wears convex, and tin concave. The former is mainly from chemical action, the latter mechanical. It is the tendency of all angular bodies to assume a spherical form when dissolved from the surface. Amalgam being a compound is acted on electro-chemically, the edges and corners present larger surfaces for such action than flat portions, besides the acid resulting from the decomposed fluids finds ready affinity in the lime salts of the enamel, and thus we often see the edges of the plug as well as the enamel rounded off in a manner to leave a slight groove around the margins of the filing, while with tin no such line occurs.

There is still another feature of amalgam seldom alluded to in the discussions on the relative merits of amalgam and gold, and we have endeavored to give reasons why amalgam in many cases preserves teeth better than gold.

It has been stated by those who believe that to be the case, that in rare instances there seems to be a contradiction, that the reaction on the dentine usually caused by gold is not found, while with amalgam the action on the amalgam plug if not on the dentine is increased. Remember, this comparison is not made to establish the merits of gold or amalgam in the great majority of teeth that may be preserved with either. While the principles given to account for the preservative properties of amalgam are fresh in mind, we deem it a proper time to

allude to this reverse order, which most of you must have noticed. It could be accounted for in a single sentence, to those acquainted with galvanism. It would be this: Change of polarity occasioned by the substitution of an alkaline fluid for one of acid.

It may be safe to assume that a normal condition of the oral secretions best contribute to the health and preservation of the dental organs. Departure from this state, if continued for considerable time, tends to decay. Tests of the fluids in mouths fostering decay generally show acidity. It acts on the teeth chemically, and on filled teeth electro-chemically, as already described. On this basis our treatment and practice is generally founded.

The reverse of this condition is doubtless the consequence of the other extreme, where the fluids are alkaline. The symptoms most prominent are excessive deposits of soft tartar, a thin coating covering surfaces not too much exposed to abrasion; teeth yellow when free from deposits; decay acting on the animal as well as the lime constituents of the teeth. Teeth thus exposed to abnormal secretions on the alkaline extreme are usually soft, yet gold fillings excite little action because the fluids do not dissolve the mineral elements like acids. In cases of leaky plugs or leaky teeth the moisture surrounding the walls is not decomposed, because there is no current to decompose it. There is no current for want of chemical action. The plug, though a conductor, has no current to conduct.

An amalgam filling under the same circumstances is corroded by the fluids as readily as by the acid extreme. Galvanic action reduces the size of the plug, without the benefit of passing the disengaged oxides over and into the organic substances as already described by opposite polarity or fluid. Thus we have a waste of the filling and also breaking down of the dentinal walls surrounding it.

In discussion, if we pursue the usual practical method, take sides and endeavor to make one or the other the better practice, there will be sufficient facts found in this paper to support either, and thus we will receive little benefit from what has been said.

It is desirable that we act on the knowledge, 1st, That chemical laws are positive.

2d, That their relations are also positive to definite conditions.

3d, That with intelligence it is the dentist's prerogative to successfully arrange the conditions.

4th, This can only be done by a correct diagnosis. — *N. Y. Transactions.*

Whisky is expensive.—It costs a man dollars and sense.— *Yonkers Statesman.*

ADAPTATION IN DENTAL PRACTICE.

DR. G. C. DABOLL, M. D. S., BUFFALO.

In N. Y. Dental Society.

There are many men in our profession, finely educated, who never get beyond mediocrity as operators. There are many who possess mechanical abilities of a high order, who scarcely attain mediocrity; others with superior natural endowments, combined with education and ability as mechanics, do no better. Thinking of this in connection with what a noted dentist once said, that "only one in fifteen in the dental profession" ever attained excellence, I reached the conclusion that with all other advantages there was still wanting a supplementary faculty essential to success. Noting, again, that not infrequently men who had been debarred from the advantages of schools and colleges, even the privileges of studentship, had reached superior positions in dentistry, I was impressed with the idea that the only rational explanation of this state of things is that these men possessed this other faculty which stood them in good stead in the absence of many others. This faculty or natural qualification I determined to be *adaptation*.

Worcester defines it as the act of fitting one thing to another, or *fitness*. The latter is, perhaps, the more expressive word.

In a letter received not long ago from an eminent member of our profession, who has made the improvement of dentistry his life work, regarding a simple appliance he had devised, he made use of this expression: "I do not think the average dentist has sufficient intelligence to make a successful application of my device," which is the reason it is not in more general use. Now this might have been true if the fact was not patent that the best men in the profession condemned the appliance as being impracticable, so that throwing the onus on men of *average intelligence* would not do. The fault lay not in a want of average intelligence, but in a lack of ability to adapt the instrument to its use. For the accomplishment of any object the first requisite is the *means;* the second is the proper adaptation "of the means to the end." We may have the first and always fail; with a faculty for the second, success is always assured. In the last decade rapid strides have been made in the progress of our profession, and in no direction so marked as in the invention and construction of appliances and machines for simplifying and perfecting oral operations. With the march of invention has come a greater necessity for the faculty of adapting the new improvements to their highest and best use. Some observations made, or rather some facts that came under my observation, impressed me with the belief that the uses of all the important modern appliances and inventions, as rubber dam, the various mallets,

the burring engine, the matrix, the clamp, etc., etc., are only imperfectly understood, and that the trouble lies in want of correct adaptation in the majority of cases. These observations came partly from complaints from operators themselves and partly from patients. The letters received by a manufacturing firm in my city regarding some automatic mallets betray the causes of trouble that prevails in many offices. One man writes: "My patients will not stand the effects of the mallet, and I am forced to return to the old method." Subsequent inquiry revealed the fact that he had the instrument set for maximum force, which in many cases would be sufficient to loosen every tooth in a half hour's sitting. This man would have had no difficulty in adapting the instrument to a piece of steel or a block of wood; but living tissue was a form of substance that he had not learned to discriminate from that which was animate. Another writes: "My mallet is out of order and I return it for repairs." The difficulty was found to be a want of oil; the instrument was simply lubricated and returned, much to the satisfaction of the dentist. If it had been a mowing machine there would not have been the slightest difficulty in adapting himself to all its requirements.

The burring engine in the hands of some operators fails to give satisfaction either to themselves or to their patients. I have in my mind a dentist of conceded ability who said he had tried the engine, but could not use it because it was so severe in its action, and had given it up entirely. Subsequently patients of his testified to its mildness compared with what they had suffered at his hands without it. There was no lack of intelligence here, there was no lack of mechanical ability, there was no want of experience; but there was lacking the faculty of adaptation to a degree that deprived him of the use of a valuable auxillary. Other men possess the faculty to a limited degree and only rarely distinguish themselves by meeting all the requirements and possibilities of the case in hand. The application of the rubber dam, I believe, tests the faculty of adaptation to its utmost, and to-day there are more dentists who cannot apply the dam effectually than there are who do. Within the past year I met a dentist of acknowledged merit, who, with all the aid afforded by clamps, had not yet been able to adapt the dam successfully to the lower molars, and yet he was quite remarkable for his ingenuity in many directions. The adaptation of Jack's matrices for the purpose intended apparently demands the highest development of this faculty, and yet of all the modern appliances it is in form the simplest, and would seemingly require the least effort; but from all my observation there is only occasionally an operator who has realized the inventor's valuation of his methed. The faculty of adaptation is not confined in dental practice to the comprehension of what is required to

make successful operators by compassing all the means to the end. It possesses quite equal value in giving the power to harmonize with the idiosyncrasies of the various temperaments we come in contact with; to be able to adapt oneself to whatever mental and physical conditions the patient is for the time subject. I believe one may have the faculty in one capacity and not in another, as witness the number of dentists who have gained the name of being excellent operators, but harsh and ungentlemanly in their manner, while *vice versa* others have the reputation of being pleasant and sympathetic in professional contact; but beyond that of not much account. Both have the faculty of adaptation in a divided sense; the desideratum is a happy combination. Can this faculty be cultivated? I believe it can, and should be by every dentist who attempts to the highest and best that his profession can give. I believe it can be taught to our students in our laboratories and operating rooms. It can be taught in our dental schools and colleges. Like every other faculty, some will possess it as a gift, others only in minor degrees; but if the teacher has it, as a rule he will have little difficulty in imparting the secret.

Adaptation is fitness; fitness for our vocation, whatever it may be, and the aim of the student should be to fit himself in the broadest sense of the term for his profession. When he has done so he will not lack the faculty of adaptation. The requirements of the present day are such, the advancement of the science so rapid, that larger powers and more constant effort, such as were not required in days past, must be brought to the work, and it behooves him, before he undertakes the task, though he possess intelligence, education, mechanical talent, physical strength and health, that in addition to these he have the faculty of *adaptation.*

Pyorrhea Alveolaris.—Dr. C. N. Peirce says: I believe it is a local expression of a systematic condition, and is largely hereditary. My experience of the progress of pyorrhea is that in every case the first thing is the filling up of the pulp-chamber before there is any deposition of lime-salts around the tooth. I believe this deposition is a sequence and not a cause of the disease, as bacteria are not the cause but only an accompaniment of caries. They do not cause caries, as they cannot take hold of healthy tooth-tissue; there must be some abnormality, though they are an exciting cause in the progress of the disease. This deposit of lime-salts is not from the saliva, but from the blood, and to remove it will cause a temporary cure. I take it away as thoroughly as possible with instruments, and then wash the sockets with sulphuric acid; this, in the strength used, is perfectly harmless, and I don't care to remove it; it is a gentle stimulant to the gum-tissue.

ACQUIRING SCIENTIFIC KNOWLEDGE.

DR. J. SMITH DODGE, NEW YORK.

The process of acquiring scientific knowledge at first hand consists of three parts: the observation of facts in nature, the deduction of a generalization from a series of related facts, and the verifying of this generalization by suitably contrived experiments. The student of dental science has peculiar advantages in pursuing this process, because the successive steps are, in his field of observation, easily distinguished. Let us take each step in order.

Observation.—It is one of the popular fallacies that nothing is easier than to see what is before one's eyes. But the fact is there is nothing more difficult. Hardly a suit is tried at law in which eye-witnesses of equal credibility do not contradict each other concerning simple facts. There is probably not a dentist in this assembly who could at this moment describe the conformation, tooth by tooth, of the full human denture, without making blunders which a dozen others would immediately detect. And yet each of the dozen in his turn would make other blunders equally as great. It will be a wholesome lesson to any who may doubt this to try the experiment of studying his watch-case or his penknife five minutes, and then attempt to write an accurate description. Now, it is just this *accurate* account which science needs. Give this, and it will fit any other observation or any continent. But the untrained mind imposes on the mental impression, and the object makes such distortions as the prevailing habit of thought or present mood or passion happens to dictate, and the untrue result passes into memory as an actual presentation of the object. But this is not scientific observation. On the contrary, it is necessary that the scientific observer be on his guard against these delusions; and even with long practice he will hardly acquire such a habit of seeing simply what is before his eyes as will relieve him of the duty of cross-examining his perceptions while the facts are still in sight.

It can hardly be necessary to insist much on the statement that the annals of dental observation are vitiated by this unpardonable fault. How else are we to take those frequent marvels which are gravely related as common in this or that gentleman's practice, but which nobody else ever sees? It is impossible to imagine that dentists lie, but it is certain they squint terribly. Let me again repeat that the difficulty is enormous of eliminating from our simplest observation that which others have reported, that which we hope to find, that which our dyspepsia or our weariness or our vanity suggests, and seeing merely that which we see. Let no man feel offended at the suggestion that he needs this purging of the eyes, or ashamed to confess that he

finds it extremely hard to achieve. Accurate observation of separate facts is the corner-stone of science, and only master masons can lay it.

Generalization.—The mind is constructed with an irrepressible tendency to generalize. The facts can hardly be observed in succession without a perception of some likeness or unlikeness, and as the series extends the comparison grows into general ideas. In fact, the mind does this work extensively and with much correctness, without our conscious effort. Men who never deliberately deduced a principle from a series of facts, nevertheless have general ideas by which they guide their conduct and to a degree predict the future. Probably a close scrutiny would show that all minds necessarily depend much on the results of such unconscious cerebration. But while the process is largely unconscious, it is still governed by those habits of mental action which we have full power to train and cultivate. He who takes care to think closely when he is purposely thinking will find his mind has done its spontaneous work in an equally accurate manner. While he who permits his desire or his sloth to vitiate his deliberate thought, will find his mind slovenly and untrusty when it works of itself.

Now, by this process of generalizing, the mind, having observed a certain thing in a certain relation again and again, relieves itself of the burden of remembering each instance separately by formulating the whole—A implies B. A swelling under the gum and certain reports of pain make the dentist as sure of an alveolar abscess as if he had extracted the tooth and seen the sac. The first imply the second. And this process of distilling the active principal from a series of fact, is the precise and constant function of science. It is the knowledge of things in their relations. Here, therefore, is the utmost need of accuracy. But here, also, is the utmost danger. The process is so fascinating that it is especially hard to keep the mind in suspense when a few data tempt it to assume rest in a general statement. All sciences, from chemistry to theology, are loaded with these hasty conclusions of former times. And a great part of the business of scientific thinkers at this day is to test anew accepted principles and eliminate venerable errors.

Of course, a set of men so nimble-minded as dentists have not been backward in this charming pursuit. No part of our history, and least of all the present, has lacked abundant instances of inaccurate generalization. Sometimes the error has lain in the faulty observations of facts, so that one may say the theory would be correct if the facts were only as they have been understood. But this goes back to the first step in the process of scientific investigation; and of that enough has been said. The inaccuracy peculiar to the process of generalizing is the deduction of general statements from too few observations. If

some dentist to the Bourbon family should declare the protruding lower jaw a normal conformation, because many of his best patients had it, he would be settling the standard of fourteen hundred million people from a dozen observations; but he would be little more hasty or inaccurate than many dental theorizers have been. Three faulty deductions current in three epochs of dental practice will make clear the nature of this error and the need of making sure the basis of our general statements.

Long ago this maxim was somewhat current: "A tooth which has ached cannot be saved." We smile at that now, and probably it was never held in its full meaning. But it was honestly meant as the summary of many fruitless attempts to manage exposed and inflamed pulps, mostly ending in disaster. The disappointed dentist might naturally conclude to ignore the rare exceptions and extract aching teeth. The error obviously lay in assuming that the limited resources of that day covered the whole possible ground; and the vice of this assumption readily appears if we consider on the one hand the very narrow limits of dental manipulation and dental medicine at the time, and on the other the large results which have gradually come from disbelieving this rule and trying for better ways.

Far more recently another maxim has had many advocates: "Any tooth that is worth filling can be saved with gold." If the New Departure has done nothing else, I fancy it has killed that idea. But most dentists who have had experience enough to know the value of a tooth have been gradually coming of late years to care less what a tooth is filled with and more for the result. To my mind it seems clear that these worshippers of gold really meant, if they had said their exact meaning, that no tooth is worth filling which gold will not save. Their error, therefore, lay in excluding from their view all teeth but a single group, and from the latter drawing a principle for universal application. Many a well eaten dinner to-day will give, against their narrowness, the testimony of despised but youthful grinders which gold could not have saved.

My third instance of hasty generalization is as novel and noisy as a new-born babe. It is the first article in the creed of the New Departure: "In proportion as teeth need saving, gold is the worst material." Since this startling law was announced many hundred dentists, as they made the customary examination of mouths long under their charge, have wondered on what evidence the statement rests, and pondered over those mystic vials in Philadelphia. I remember a central upper incisior which split from side to side, throwing off the entire face from the groove on the cutting edge to a point far under the gum, and laying open the empty pulp-chamber. The

mouth was well filled with good teeth, and it seemed as if the need of saving that tooth was of the largest proportion. It was nothing wonderful to replace the lost half with gold, nor was I surprised to find it in perfect condition after six years' service; but considering the great need this tooth had of filling, I was puzzled to understand why gold was the worst material that could have been used. And we should stay here a week if every dentist present gave the many cases of equal plainness which he can recall. Confronted with these every-day facts, the departing brethren would doubtless say they did not mean these, and on cross-examination it might probably come out that their minds were chiefly fixed on the *cervical* borders of proximal fillings in bicuspids and molars. To which injured and hindered science would reproachfully answer, "Then why did you not say so?" It can hardly be doubted that the daily experience of the profession will soon make plain that this latest novelty in generalization is the fruit of minds which have so far concentrated their gaze on certain facts as to forget all others and make the part equal to the whole. It may seem too much space has been given this topic. But no space can be too great if it impresses on our minds the exceeding difficulty and importance of accuracy in drawing general ideas from individual observations. And I will take the liberty of suggesting to our teachers that they should *incubate* long and patiently over their facts before they presume to announce what manner of fowl they have hatched. Meanwhile, nothing will be more useful or more scientific than a constant familiarity with certain qualifying words and phrases: "Probably," "In my opinion," "So far as is known."

Verification, by experiment, is the final step. And here the branch of operative dentistry has all the advantages of an applied science dealing with familiar things. When Columbus had inferred the rotundity of the earth, it took him many years of toil and delay before he could try the experiment of sailing westward. When Ericsson had deduced the idea of the screw propeller, it required governmental aid, which was not easily obtained, to test the invention on a satisfactory scale. But when the operative dentist has slowly worked out a new idea relating to his art, he may confidently expect within a week or two the chance of putting it to the test. Every trial of a new material or a new instrument, every new shaping of a tooth or a cavity, every new medicine laid on a pulp, or injected into an abscess, is, in the best and scientific sense, an experiment, provided only it be made not at hap-hazard, but with a definite theory to test, and an intelligent choice of cases. Add to these the experiments of the laboratory, which are so happily becoming frequent among us, and the observations of the microscope and the scalpel, and it cannot be said that dentists are neglecting this crowning portion of scientific research.—*N. Y. Transactions.*

A LACK OF SUFFICIENT VARIETY OF FOOD.

PROF. AMBROSE MORRISON, EDITOR "DENTAL HEADLIGHT."

A perfect dietary must include all the several proximate elements necessary for the nutrition of our bodies.

First and most important is *albumen*. This is found chiefly in lean meat, the white of eggs, milk, and to a limited extent in vegetables.

The hydro-carbons, *starch, sugar and fats*. Starch exists largely in vegetables; sugar chiefly in vegetables, but is found also in blood, milk, and livers of animals. The fats are constituent elements of both animal and vegetable organisms.

The organic elements, named such because they are chiefly derived from inorganic compounds. As typical members of this class, we mention *water, phosphate of lime and chloride of sodium*. We have enumerated these principles in the order of their importance.

The albuminous class of proximate elements are appropriated to the nutrition and growth of the nervous and muscular organs of the body. The carbo-hydrates, *i. e.*, starch and sugar, are converted into fat and either go to build up the adipose tissues of the system, or by oxidation (slow combustion) are utilized in the production of animal heat. The fats are the principal source of animal heat, acting also as fuel to the nervo-muscular apparatus, resulting in the liberation of nervo-muscular energy.

The inorganic elements of these, *water*, is found in every tissue, even in the enamel of the teeth, and its uses are manifold. It gives fluidity to the blood and all the secretions, and consistency to all the solid and semi-solid tissues.

The processes of osmosis and absorption are materially facilitated by water. It acts as a solvent not only for the food, but also of the worn-out elements, assisting in their removal from the body, and by its evaporation from the cutaneous surface the temperature of the blood is regulated.

The saline members of this class are useful in giving solidity and stability to the bones and other hard structures of the body.

We have alkalinity in most of the fluids. *Chloride of sodium* promotes the appetite and digestion, and from the fact that it is the most abundant solid constituent of the animal fluids, it materially modifies osmosis.

The nutritive value of any food depends on the relative abundance of these elements, and no dietary is complete without a proper proportion of each. *Wheaten bread* is the "staff of life" because it contains all these principles, and for the same reason milk, on which the infant is nourished, might well be termed the "elixir of life."

Tennessee and Kentucky and other countries enjoying a similar

climate are renowned for the magnificent specimens of the *genus-homo*, as well as the superior excellence of the low animals which are born and reared within their borders. This can only be accounted for by the greater variety of food which these countries produce. According to Prof. Proctor "the men of Kentucky and Tennessee are of superb physique, excelling in hight, weight, circumference of head and circumference of chest, ratio of weight to stature, and proportional number of tall men. It is well-known that horses and all animals of these sections are superior to those of all other countries."

WHAT IS THE CAUSE OF THIS DISCOLORATION?

In August last Miss McCord, living some twenty-five miles in the country, applied to me to have the cutting edge of the left superior central incisor restored to its natural contour with gold, about one-eighth of an inch having been broken squarely off. The tooth had been previously filled. The pulp chamber and canal were free from fetid odor or debris that I considered remains of the pulp. There having been no previous soreness, and none at the time of examination, I decided on immediate root filling. I thoroughly washed the cavity with tepid water, and cleaned thoroughly to the apex. Then filled the upper half of the nerve canal with chloropercha, the pulp chamber with phosphate-zinc, imbedding a Howe screw-post in the cement, and letting it extend to nearly the cutting edge, to be contoured with gold. In about three months the young lady returned, with the tooth a bright grass green color, the color extending from the gum (where it is the darkest) to within a line of the filling. Before filling I noticed no more discoloration than is usual in a pulpless tooth.

What is the cause of this peculiar discoloration? How can I bleach it? B. F. PHILBROOK, Dunlap, Iowa.

Be Inventive.—There are few expressions we hear more frequently than that feeble wail of the cowardly or lazy mind, "I can't!" Every day we see people who permit their progress to be stopted by trifles which, instead of retarding them, should spur every faculty to the resistive, conquering point. "I can't" and "I forgot" are two fatal phrases which should be scratched from the vocabulary of every young man or woman who is ambitious of being or doing anything in this world that shall deserve to be recorded.

Be inventive. Cultivate the creative side of your brain. Don't be stumped. When you seem to be cornered is the very moment to stir yourself and devise some way of making things work. No man or woman, or even boy or girl, is of use till tried and disciplined by difficulties. Ease, an even course, prosperity are not the stuff of which our greatest men are made.—*Sc. American.*

CAUSES OF CARIES.

DR. C. N. JOHNSON.

There are two general causes of dental caries—predisposing and exciting. By predisposing cause we mean some inherent defect in the tooth structure due to defective development, or some condition of the teeth or surrounding parts other than the normal, such as irregularity, whereby the tooth is rendered susceptible to the attack of decay. By exciting cause we mean some agent which, after the tooth has been predisposed to caries, acts on it to bring about decay. The exciting cause is the active agent in caries. Thus we see a tooth which possibly may not be perfect in its development will remain in the mouth free from caries, if there is no exciting cause. This has led to a close search for the active agent in decay, and it is to the consideration of this phase of the subject that the present paper is devoted

The first intelligent theory advanced as to the cause of dental caries was published some few years prior to 1835. At the latter date Wm. Robertson wrote on the subject, but before his time Fox and Bell had published their theory, which was that caries resulted from inflammation. Fox claimed that decay was induced by inflammation of the lining membrane of the pulp cavity. Bell thought that the inflammation began in the membrane between the dentine and enamel. Robertson claimed that the cause of decay came from the outside, that the progress of the disease was from without inward, and that the tooth remained perfectly passive under it.

We have to this day the two factions regarding the cause of caries. The inflammation theory is championed by such gentlemen as Drs. Abbott and Heitzmann, of New York; while the theory that caries is caused by some external agent has advocates among the learned men on both sides of the ocean. This latter theory must, I think, in the light of recent investigation, be eventually admitted as the only satisfactory theory.

From the time of Robertson to within a very few years, the profession had made no real progress in the way of solving the problem. He told us the cause came from an external source, and that the vital action of the tooth had nothing to do with the process of decay; but he did not tell us what the agent acting on the tooth from without was. Dr. Watt advocated the theory that the mineral acids were the active agents causing caries, and divided the decay into three classes: 1st, the white decay, caused by nitric acid; 2d, yellowish decay, caused by hydrochloric acid; and 3d, the black decay, caused by sulphuric acid. The mineral acid theory, however, has been practically disproved, from the fact that by treating dentine with any of the mineral acids, of the strength with which they may be found in the mouth,

the walls of the dental tubuli are not destroyed. The contents only of the tubuli are dissolved out. Now, in true dental caries we find the walls in many places completely broken down, so that there is nothing analogous in the two processes. Nor are we to believe, according to Dr. Black, that the color of the decay is in any way associated with the carious process. All decay is white in its primary condition, and the color is modified after the decay has taken place.

Up to the time of Dr. Miller's investigations we had no satisfactory proof as to what the active agent in dental caries might be. Dr. Miller instituted a different process of investigation from any of his predecessors. They had been studying mostly by analysis, and had been picking carious dentine apart, and analyzing it, to find what had produced it. They had been searching in the mouth for agents which might be considered capable of bringing about decay. Dr. Miller began work on the synthetical plan. He produced caries artificially. He, by the use of chemical agents, brought about decay, that could not be distinguished in any particular from caries that had occurred in the mouth. The agent producing decay similar to natural caries was lactic acid. The next step, then, was to account for the presence of lactic acid in the mouth. To do this we must go back a little, and consider some of the conditions of life as manifested in the entire animal and vegetable world.

Every living cell, whether animal or vegetable, must support its life and material structure by the appropriation and remoleculization of matter within itself, and as a result of this remoleculization we have waste products formed. For instance, the result of remoleculization in the material body of man is a waste product called urea. Different organisms excrete different waste products, and so we find that there is a family of micro-organisms whose waste product is lactic acid. This micro-organism is found abundantly in the mouth, and two varieties especially are almost uniformly present in carious cavities. The names of these two are streptococcus media and streptococcus parvus. Here, then, we think we have very conclusive evidence as to what the cause of dental caries really is. We find, first of all, that we can produce caries with a certain acid; we then find that certain micro-organisms produce this identical acid as their waste product; further on we discover these micro-organisms existing abundantly in the mouth, and especially in carious cavities; and last of all, we can take a perfectly sterilized culture-fluid, and by placing a small portion of carious dentine in it we can grow these micro-organisms in abundance, and they will produce there, in that previously neutral culture-fluid, this very lactic acid that we have found will cause decay.

The micro-organism theory of decay has been held in disrepute by

many otherwise able thinkers, from the fact that at one time the theory was strenuously advanced that micro-organisms brought about decay by a process of burrowing into the dense structure of the tooth; that they literally ate the tooth up, and used its substance for their own food material. This manifestly absurd idea went forth at one time as the micro-organism theory of decay, and it is little wonder the name micro organism was rendered a synonym for everything ridiculous. However, it is now well understood that decay is not caused by the body of the micro-organism, but by its waste product, which acts as a digestive body to dissolve the tooth structure.

The advocates of the inflammation theory ask us why it is that decay does not go on under a filling when we leave partially decalcified dentine, containing micro-organisms, in the bottom of a cavity. They claim that if caries is caused by the micro-organisms, decay will necessarily go on under a filling when they are present; but they forget the fact that micro-organisms require food to maintain their life the same as higher organisms. Now, this food-material, on which the micro-organism of decay exists, comes from the outside. It does not receive a particle of its support from the tooth structure. It requires starch or sugar for its maintenance, and as soon as the supply of starch or sugar is cut off the micro-organism necessarily dies or becomes inert. With a far better show of logic we may ask them why it is, if dental caries is an inflammatory process, that we find it progressing the same in the dentine of a pulpless tooth that we do in a tooth where the pulp is alive? This question has never been satisfactorily answered by the advocates of the inflammation theory. On the hypothesis of the micro-organism theory we can easily understand that the vitality of the tooth has nothing of importance to do with the carious process; that the waste product of the micro-organism, lactic acid, will dissolve away dentine in a tooth where the pulp has been destroyed in exactly the same manner, and to the same extent, that it will in a tooth where the pulp is alive. If we found on the death of the pulp a check to the process; if we could discover any marked change in the progress of the disease at this point, then we might look to some vital process connected with the circulation for a solution of the phenomena presented. But when we see decay going on, day by day, with the same regularity after as before the death of the pulp; when we see the process undisturbed in any way by the suspension of the circulation as carried on in the dentine, through the medium of the pulp, then we are naturally forced into the conviction that the active agent in decay comes from an external source, and that the tooth, so far at least as causative principles are concerned, remains passive under it.

The only plausible theory advanced from the inflammation standpoint as to decay in a pulpless tooth, takes its origin in the fact that there is a circulation from the peridental membrane through the cement, even after the pulp is dead. This is an exceedingly slender thread on which to hang a theory. We all know there is a very limited communication between the peridental membrane and the dentine of the root, if indeed any; and to claim that the dentine in the crown of the tooth receives, from the peridental membrane surrounding the root, a sufficient circulation to admit of inflammatory action, amounting to destruction of the tissue, is preposterous.—*Dental Review.*

HOW TO SUCCEED.

Chauncey M. Depew gave wise counsel to the graduating class of the Syracuse Medical College. They may be well heeded by those just entering the dental profession:

I have no faith in mottoes or maxims or rules for success, and, though often asked, never have any to give. A young man who has good health, and governs his conduct by a conscientious answer to the ever-present question, would my mother approve? and gives tireless attention to his business, is certain to succeed. It is impossible for every one to win fame or fortune, or both; but the man who earns a living, even in a very modest way, feels the inspiration of independence, and has safely passed the precipice of failure. Repinings for riches and angry envy of prosperity weaken the moral tone and mental fiber. They paralyze effort and end in empty vaporings in the bar-room and empty larders at home. The opportunities for accumulating large fortunes rarely come to members of the liberal professions. Their compensations are in the position and influence accorded to their culture and training. With them self-support is success, and when the surplus surely comes, and with it home, larger comforts and fair competence for declining years, they enjoy a measure of happiness and content rarely found with the use and care of great wealth.

The rush and worry, the wear and tear, the rapid pace of our American life, irritate our nerves and render us peculiarly sensitive to impressions. The personality of the doctor, his disposition, his habits and his character form a large part of his success or failure. The vain and pompous doctor who thinks so much of himself that he fails to appreciate the weakness and watchfulness of the sick leaves behind him a sense of neglect and indifference which neutralizes his medicine. The discursive and argumentative doctor airs his opinions on politics or theology to aching bones and fevered brains till only weakness keeps the outraged victim from murder. The grossest injury to the helpless patient, absorbing with every breath the spirit of her environment, is the polluting presence of the doctor saturated with whisky

or tobacco. But when the clean, cheerful and hopeful physician enters the room he brings in comfort and health. The sufferer knows that this man is able and skilful, that his brain and heart are full of the case, that his sympathies follow his efforts, and the potentiality of his powders is intensified by the inspiring magnetism of his personality. He is welcomed with faith, and blessings follow his departure. He exorcises despair and is the victor over death.

PRACTICAL WORDS.

DR. GEORGE A. MILLS, BROOKLYN.

In New York Society.

The intelligent use of materials for fillings holding within themselves an irritating or stimulating agency for the improvement of teeth erupted with a deficiency of calcification, is a practice that can be commended and sustained on true scientific principles. Stimulus—which is another nomination for irritancy—is the power that moves the whole creation. An organism that has it in equilibrium is favored; we might safely say, is healthy, sound.

We see many teeth that lack a sufficiency of stimulus, it may be, in the motory or sensory nerves, or a deficiency of nourishment in the general system; sometimes, possibly, an *over* stimulus in the sensory nerves, thus producing a debilatory condition of the nervous system throughout the lines of influence. We notice, often, a marked deficiency in the enamel, indicated by its thinness in some cases, and the failure of fusion at the points of calcification at the base of the denticles in others; suggesting periodic conditions of a want of stimulus.

I am aware the practice of attempting to improve this class of teeth spoken of is not altogether new. Yet it has not been admitted, only in a limited degree, into the arena of discussion. For several years I have been to some extent aware of the possibilities or improving the structure of poorly organized teeth by applying a stimulating agency, such as are found in the class of filling materials under the head of oxychloride of zinc preparations. I will instance one marked case which came under my care about seven years ago. The age of the patient was 18 years; a blonde; of nervo-sanguine temperament. The teeth were in a state of general decay, deep-seated and very sensitive; one pulp exposed in the superior lateral incisor. I decided to make use of this stimulating agent throughout the teeth, and used the German "Cement Plombe." With the proper instruments I simply prepared the margins of the cavities, and removed all the loose material that would come away with warm water from the syringe, then saturated with creasote, and filled. After a few weeks I recommended filling with gold among the simple cavities, and found with these a marked

improvement, particularly the lessened sensitiveness. I was occupied with this case over a period of one year, and the results occurring from this treatment proved permanently satisfactory. I was able to put the mouth in complete order with a degree of comfort extremely gratifying to myself and the patient. I refilled all these cavities with gold, except the lateral incisor with the exposed pulp.

An additional fact I wish to mention—the improvement of the dentine; it was decidedly changed in its density. While this case was in my hands, an article from Prof. Garretson, of Philadelphia, was published in the *Dental Cosmos* (Aug '74), commending the same treatment I had been pursuing. It is an article well worth perusal to-day, nor has it lost its truthfulness by age. I quote his words as follows: "It is not infrequent we see cases of arrested decay by the irritancy of the inflammatory action at work in the process of unbuilding the tissues or as the common term expresses it 'of decay;' this action producing a stimulating effect on the pulp, arousing it to increased activity to prevent the inroad of the destroyer, by sealing up with, or depositing a hard tissue as a barrier against the further approach of the invader. As Dr. Atkinson says, "pain is nature's signal of caution or danger," so may not the impingement (caused by the inflammatory action) or the current of the sensory nerve stimulate a greater degree of action of the motor nerve, and thus establish a self-defense on the same principle. I believe gold will often prove a better material for filling a large number of teeth, even the younger ones, than a material of less conductibility. I have filled many cavities, not a few in young teeth, with gutta percha as a temporary filling, thinking to relieve them of their sensitiveness, and often, to my surprise, I found on removing it, not only the same degree of sensitiveness, but in many cases more. I am now convinced by practice that, had they been filled either with gold (in some cases) or the oxychlorides, they would have been relieved, and much improved in their structural condition, because of the stimulant they would have received. While under tuition at Heitzman's laboratory, this subject of the stimulating effect of the inflammatory action was so intelligently placed before the mind by his teachings, showing the rationality of bringing stimulus to bear upon the pulp as a therapeutic agent, increasing the tooth building power by bringing forward a larger amount of calcific action. This teaching tended to strengthen and confirm what I had learned from observations in practice, and it readily suggests to thinking minds that his teachings are eminently practical.

We shall be compelled to go behind the common every day knowledge applied to the treatment of the disabilities so prevailent in our every day practice, to be able to secure the results that our patients

have a right to demand. By this I mean simply an improved standard of tooth structure, and this cannot be done in its larger sense without a familiar knowledge of the histological formation of the tooth. Only by such intelligence can we come into the position that we can render helpful aid to nature; and more, when we do know how a tooth is formed, and have become familiar with all the ramifications of the living substance, because "our eyes have seen it," we will hesitate, more than now, before we unhesitatingly cause a deep sleep to come on the pulp, and allow it, perchance, to follow on in these avenues of life, and cause destruction to all the connective supplies of nutrition, thus producing a foreign and useless body.

The Secret of Discovery.—We dentists are confronted with a multitude of things already known and another multitude, which no man can number, of things pressing to discovery. The only possibility of having all these at our command lies in knowing them *in their relations*, which is science. And the fundamental requirement for obtaining such scientific possession is *accuracy*,—accuracy of eye and touch, accuracy of perception and memory, accuracy of comparison and induction, accuracy of test and accuracy of speech, in a word such accuracy of the whole observing man as may be worthy to set itself beside that infinite accuracy of fact which we call the Laws of Nature.—*J. Smith Dodge.*

Who Will Answer?—Please state in your journal, if it is not asking too much, the treatment for a girl of fourteen years with the canine upper coming out, extending forward against the lip, instead of growing out in natural direction. They project forward so much that their extraction would probably mar the contour of the lips, letting them sink in. The first bicuspids are close against lateral incisors.

Sturgis, Dakota. R. P. SMITH.

Humbuggery.—Enclosed find a small bill from the office of one of our dentists; also, the card of the inventor of the preparation used by this dentist. Can you give any information regarding this local anesthetic? "The great wonder of the age; absolutely true, or no pay; teeth extracted without pain, by applying a harmless drug on the gums. It is a secret process. I am the sole owner for Norfolk, and the only one who can use it in this city. Over a hundred names of resident testimonials at my office."

Brown: "You don't look well, lately, Robinson." Robinson: "No, I can't sleep at night on account of lung trouble." Brown: "Nonsense; your lungs are all right!" Robinson: "Yes, mine are; the trouble is with the baby's."—*Life.*

THE PROFESSION OVERCROWDED.

(Editorial in *Dental Review.*)

Apropos of this expression, now so frequently resorted to when speaking of the condition of the dental profession, an address recently delivered before the graduating class of the Chicago College of Dental Surgery contains some terse and appropriate remarks on this question. It is certain that the supply, as yet, does not equal the demand; provided, however, that the people advance in education pertaining to the dental organs in the same ratio as in other departments of education. The furtherance of this object—the education of the people on topics pertaining to the teeth—is one of the important duties of those who now enter the profession, and who are supposed to overcrowd its anks.

It is said that the negroes in this country have multiplied eight times in a century. As there are 7,000,000 now, there will be 192,000,000 in 1980, less than a century hence. The whites in ten years, by birth and immigration, have increased 30 per cent. Presuming that the same ratio will be maintained—and there is no reason to presume otherwise—in 1988 there will be 800,000,000 whites and 200,000,000 negroes in the United States. With anything and everything that may be done to lessen the possibilities of decay, three generations will not diminish to any appreciable extent the amount of dental service required by every man, woman, and child; hence, in 100 years from now there will be sufficient dentists needed to supply 1,000,000,000 people with dental services. Taking the number of dentists now in the United States—16,000—and computing the ratio of increase to the ranks which has prevailed during the last five years (being the most marked period in this respect in the history of dentistry), in 1988 there will have been conferred the degree of Doctor of Dental Surgery on nearly 580,000, of whom 400,000 will be living and practicing dentistry. To-day, with a majority of the people not availing themselves of the benefits of dentistry, there is one dentist to every 4,000 of the population, and 100 years hence there will be one dentist to every 2,500, provided the increase in the profession keeps pace with the increase of the people. Presuming that 100 years from now, by education the people will require twice the amount of service that they do to-day—not an unreasonable supposition—and that this increased demand be diminished entirely by prophylaxis and by the preventive measures of the dentist—there would still be but one dentist to every 2,500 of population, surely not an excessive number of dentists. The fees paid for professional services will be regulated entirely by the conduct of those within the ranks of the profession, and will be commensurate with the price of labor, the conditions of commerce, finance, and the general prosperity of the country.

HOW TO AVOID CATCHING COLD.

PROF. AMBROSE MORRISON.

1. Rub the skin briskly every morning, applying gentle friction to the *entire surface of the body* with a coarse towel, dipt in cold water. If the system is weak, or there is an aversion for cold, rub with a dry towel, or preferably with the palm of the hand. "Massage" is now recognized as a most important prophylactic and therapeutic agent. Certain it is, that rubbing the *entire body daily* is as beneficial to man as grooming to the horse. It is only necessary to call attention to the well-groomed horse of the livery stable, with his sleek, glossy coat and spirited action, as compared with the shaggy hide, sluggish moving country horse, who is usually neglected in this particular.

2. Breathe exclusively through the nostrils, thereby avoiding the contact of cold air, dust and other irritating substances with the sensitive mucous membrane of the throat and pulmonary organs. The peculiar anatomical construction of the nose, with its turbinated bones, projecting like mansard roofing, and with its bristling hairs at the external orifice, effectually prevent the passage of foreign substances through these cavities; while the numerous and spacious sinuses, which communicate with the nasal fosse, admits of the thorough warming of the cold atmosphere ere it reaches the lungs. The nose, by virtue of the olfactory sense, stands as a sentinel over the mouth, warning us promptly of the presence of offensive and poisonous gasses, and we instinctively cease breathing, or at least inhibit the process till we are clear of the deleterious emanations. Persons who breathe through the mouth are more susceptible to contagious and infectious diseases, to say nothing of the dry and irritable state of the oral tissues consequent on this deplorable habit. The disagreeable habit of snoring is occasioned by the vibration of the soft palate between the double currents of air, which enter the mouth and nose simultaneously.

3. Keep the sleeping apartment well ventilated, even during the coldest weather. The window sashes should be lowered at the top and elevated at the bottom, thus securing the circulation of fresh air. The cold air entering at the lower opening, while the impure air, being rarified by heat, rises and gains exit at the upper.

4. Keep the lungs well filled by practicing deep and systematic inhalation through the notrils; thus strengthening the muscles of respiration, and greatly increasing the vital capacity of the pulmonary organs. A copious supply of pure air is essential, not only to the purification of the blood, which is effected by the introduction of oxygen, and the removal of carbon di-oxide, and other products of tissue-waste, but is equally needed for the maintenance of animal heat. The temperature of the body is the result of the oxidation or slow com-

bustion of the hyro-carbonaceous elements of the food and animal tissues.

5. Take abundant exercise in the open air, thereby stimulating the appetite, quickening the circulation of the blood, and increasing the number and force of the acts of respiration.—*Dental Headlight.*

THE CALIFORNIA DENTAL LAW.

The California dental law seems to be defective. In Los Angeles the Southern California Odontological Society has been trying to inforce it against unlicensed dentists, and failed. They now want the law amended. In a report of a committee to look into this subject they find: California for many years was the dumping-ground of eastern dental refuse. The passage of stringent laws governing the practice of dentistry in the Eastern States drove them from their native haunts, and California, with its many attractions, and no dental law, was inundated with dentists. The passage of the dental act in 1885 has partially checked this flood of dental drift, and it will be noticed, upon examining the report of the State Board of Dental Examiners, that most of the applicants to practice have been graduates, and in this city, out of the 10 new (registered) dentists, seven are graduates, a very creditable showing. Now, that the intention of the law is to be defied, and that defiance to be based upon the verdict of a class of men who this law was framed to protect and benefit, seems indeed too bad. A law that will cause the dental profession to be better educated would be one of the most benificent imaginable, and we, your committee, would urge that a proper amendment be offered at the next session of our Legislature that shall completely close the back door and allow none to begin practice in this State without having first properly prepared himself; and we, your committee, deem graduation from some reputable college as absolutely necessary before beginnning practice. The opponents of such a measure will strive to make out that we are endeavoring to create a monopoly and scheming to extort colossal bills from the bloated bondholder. A few figures relative to the number of dentists to the population in California is very interesting to us, and furnishes food for reflection. The last report of the State Dental Examining Board shows 557 legally registered dentists, and to this number can be added at least 40 more who are practicing without having registered, giving us one dentist to about every 1600 men, women and children. Eliminating the Chinese, it makes about one dentist to about every 1200 whites. Illinois, with three times our population, has only 925 dentists in practice. Wisconsin, with a third more people, shows but 357 dentists. Iowa has but one dentist to every 4500 people, and the whole United States shows but one dentist

to every 4000 people. The editor of the *Dental Review* estimates that in 100 years more the dental profession will have increased so that there will be 400,000 dentists in practice, and the ratio will be one to every 2500. Now, gentlemen, you will observe that we have passed the line and are trying to do what no other country in the world ever before attempted, viz., to support one dentist to every 1200 or 1500 people. It is not necessary to enter into a discussion of what the result will be. Every one must judge for himself and act accordingly.

Implantation.—Dr. Atkinson says: I have never said that implantation would be a success. I have said, and I say now, that it looks as if it would be a grand success, and a more pronounced success than in the history of any other operation that I have followed through my professional career. It is not prophesying to state facts. I have several interesting cases to report.

Pulverized Pumice and Glycerin, mixt and kneaded into a stiff dough, will be found useful for taking impressions of tooth-cusps or other surfaces which it is desirable to reproduce in metal to serve as dies. Molten metal of any kind can be at once poured into such molds. The dough may be agreeably perfumed with a few drops of lycopodium.—*H. P. Osborn, South Orange, N. J., in Cosmos.*

To Wash Chamois' Skins.—Use a weak solution of soda and warm water, rub plenty of soap into the leather, and allow it to remain in, soak for two hours, then rub it sufficiently, and rinse in a weak solution of warm water, soda and soap. If rinsed in water only, it becomes hard when dry and unfit for use. After rinsing, wring out in a rough towel, and dry quickly, then pull it about and brush it well.—*Scientific American.*

There is now, has always been, and ever will be in this world, a class of men so lean of soul, so poor of spirit, and so selfish, narrow-minded and contracted in their views that they see a mortal enemy in every man who may differs from them in any way or aspires to honors which are open to all. Such men know no other manner of warfare than that which is held by the savages—to kill and to destroy. They never seek to raise themselves to the level of the good and the great, but hope to succeed by pulling others down to their own level.—*Rockdale (Texas) Reporter.*

Every good writer is to be read, and diligently; and, when the volume is finished, is to be gone through again from the beginning.—*Quintilian, A. D. 100.*

For Our Patients

AMBIGUITY.

"A well-known gentleman of New York has married his type-writer." My, what a union! I have heard of an old maid who married her old cat, and of a batchelder who married his gun; but here is a man who has married his type-writer. In what esteem he must have held it!

The *New York Tribune*, in speaking of this ambiguous phrase, says we need two new words in our language; the *Christian Advocate* seconds the motion. The *Tribune* says "*Typograph* should designate the instrument, and *Typoscript* the production." But what word shall we have for the worker? They have not yet named the fair lady's employment that this "well-known gentleman married." Was she a *typoscribe!*

The account would be intelligent if we manufacture this word, and read thus:

A well-known gentleman of New York has married his typoscribe. This may have been a very sensible thing to do. For most of these typoscribes are nice young ladies.

Popular Dental Instruction.—The greatest hinderance in the way of presenting professional subjects to a mixt audience grows out of the technical manner resorted to in professional schools of unnecessarily obscuring the meaning to all but those specially instructed in technical terms. Any one who has clear apprehensions of the subject of his discourse may easily find language to communicate any thing he has reduced to the status of knowledge. Divinity, law and medicine are to this day overlaid in their text-books by the wretchedness of technicality unnecessarily employed, and when we speak to the advocates of this method they assume a squeamish delicacy by saying it would be immodest to call attention to the various parts of the body by a name that all would understand. As children we were taught that we only had head, stomach and heels, and were thus necessarily limited in making known our sufferings to our nurses. Some of the old Quakers did allow their children to have belly-ache, but it was doubtful whether *that* should not have been stomach-ache in view of the anatomical nominations allowed.—*W. H. Atkinson.*

A Misplaced Nose.—"The times are hard, my dear," said a man to his better half, "and I find it difficult to keep my nose above water." "You could easily keep your nose above water," returned the lady, "If you didn't keep it so often above brandy."

SCALPS.

The prowess of the Indian warrior is estimated by the number of scalps he has taken in battle, whether by fair or foul means. But as he becomes civilized and educated in humane and Christian principles his motives and habits become changed, and he more truly serves the end for which he was created.

In the dental profession we have many who, like untutored savages, are constantly aiming at gathering scalps in the shape of human teeth, and the more edentulous jaws they can refer to in their note books, the more proof they suppose they possess of their success in business. This would be well enough if the teeth extracted were such as could not be saved by proper care and skill in filling. But too many so-called dentists are mere third-rate mechanicians, and can do no better than to educate illiterate people up to the standard of their own attainments. And it is found not infrequently that the people are in advance of this class of men. Too often the masses are educated to believe that the Creator made a mistake in the construction of the human frame, and these self-sufficient fellows must need improve on the work of the Great Architect by sacrificing the natural and inserting rows of lusterless cheap store teeth, that more nearly resemble tombstones than the natural looking substitutes they might be made to resemble. Is this honest? Should not everybody expect better things than such a wholesale slaughter, merely because these fellows know nothing of the art of saving the teeth they ruthlessly destroy?

Physicians, too, in town and country, are guilty of the same human destruction, frequently sacrificing useful organs they have no right to meddle with. Instances are innumerable where people apply to a doctor or a dentist and demand the extraction of all their teeth, when the removal or proper medication of one or more only is indicated; but to gratify a caprice the demand is complied with, instead of giving proper or rational advice and refusing an unjust demand for fear of losing caste in the eyes of a wrongly educated person. We need more conscientious trainers, educators and operators in the dental profession. The motto should be "millions for conservation, but not one tooth for sacrifice." M.D., L.D.

Surgically Killing Pulps.—The advantage of surgically killing pulps of teeth over poisoning them to death is that the former method leaves the pulp at the exterior of the apex of the root simply an incised wound, which will heal by first intention, so that the growth of an abscess seldom results; but by poisoning the pulp to death by arsenic, &c., putrescence is almost sure to follow, and following this comes the abscess.

Intelligent Examination.—We are beset by theorizers so ignorant of scientific methods that they suppose the whole process to be complete when they have looked at facts and spun from them a theory. Then the noise begins, and the wonderful discoveries are announced which startle us to-day and amuse us to-morrow. Let us all remember that science holds to facts at both ends. Her work begins with observing them as nature presents them, and ends with submitting to their inexorable decision under experiment whatever she has inferred. So there is not and there never can be a single theory or general statement of anything in the universe which is a part of true science, except those which have been fully verified by the test of experiment. All besides is opinion or conjecture, variably useful and often the best we can attain for the present, but wanting something still to make it scientific truth. But he who has patiently gone through this process,—has accurately observed, accurately generalized and accurately verified,—has enlarged the boundaries of human knowledge, and has claim to the respect and honor of mankind, whether the object of his research be the axis-cylinder of nerves or the order of the heavens.—*J. Smith Dodge.*

His Specialty.—A well-to-do lady in Schenectady having occasion to send for a physician, he is reported to have prefaced his professional visit with the statement that the eminent neurologist, Dr. A., had taken charge of her brain and nervous system; Dr. B., the celebrated physical diagnostician, had looked after her heart and lungs; Dr. C., whose book on diseases of the liver had made him famous, attended to her digestive organs; Dr. D., the distinguished gynecologist, treated her uterine functions; Dr. E., the renowned orthopedist, had been consulted about her joints and limbs; Dr. F., the great opthalmologist, cared for her eyes and ears; Dr. G., the eminent dentist, had sole charge of her mouth; Dr. H., the learned dermatologist, prescribed for any cutaneous affection.

"Why have you sent for me," asked the doctor; "there is nothing left but the umbilicus. As my specialty is pathology, if you will have me summoned after your death, I will gladly make a post-mortem examination."—*Transactions New York State Medical Society.*

"Does your husband still call you by pet names?" one married lady asked another. "Well, not quite. When we were first married he used to call me a kitten; now he calls me an old cat."

Read not to contradict and confute, nor to believe and take for granted, nor to find talk and discourse, but to weigh and consider. Reading maketh a full man; conference a ready man; and writing an exact man.—*Bacon, 1600.*

Editorial.

ARE THERE TOO MANY DENTISTS?

When we consider there are 15,000 dentists in the United States, some may wonder where they all can get their living. These wonderers would wonder more if they looked in our dental colleges, and saw the throng of more than 2000 constantly pressing forward for room. But before we feel sure there are too many dentists, even with this yearly multitude struggling for place, let us consider:

1st. Of these 2000 students, one-fourth should be at the plow, or at some employment requiring strong muscles, but little skill. They are not built in body or mind for skilled dentists. By perseverance (which most of this class display) some may fairly succeed, but the most of these dull, uncultured, awkward class will gradually drop out before being titled. Another fourth are rather shrewd, quick witted, intelligent fellows; but so rattled brained, disorderly and bombastic, so bent on nonsense, or something worse, that most of these "fail to pass." Of the remaining half, some fail from discouragements, or lack of means, or health, or are switched off by unexpected inducements in other directions.

But in spite of all these hindrances there were 1200 graduated last year; and every year an increasing number is turned out titled D.D.S.

2d. But in all businesses the majority fail, and the more skill and learning an occupation requires the more the failures. Hardly three-fourth of this half who succeed in graduating will be in practice after the first year, and many will never practice at all. But we need nearly all this accession to make up for their predecessors who die or fail.

3d. The population of the country is rapidly increasing, so that more dentists are required. Dentists are not increasing in proportion to the population.

4th. Every year, the masses are giving more attention to their teeth, and therefore requiring more and better work, so that more dentists were required in proportion to the population.

We conclude therefore that there are not too many dentists. There is less and less room for poor dentists, because of the increased intelligence of the people; but for dentists of skill and intelligence, there is not only plenty of room, but an urgent demand.

Do not neglect your business. The man who neglects his business soon finds he has no business to neglect.

AND STILL WE HAVE GENERALS, AND THE RANK AND FILE.

War develops military talent and skill, but peace is quite as prolific of great geniuses; we still have our generals and our captains and our corporals and our rank and file. All cannot be officers, but the men who are made of the right stuff rise and shine. They are brilliant in war, if there is war, and in peace, if there is peace.

But this cannot be done by mere bombast and assumption; by a bound and a word. To be a general in position, resources and command, there must be that gradual climbing from the ranks to the higher positions, that discipline and grit, hard knocks and daring, which alone can produce growth and maturity, solidity and success. These are the processes and qualities of which great generals are made. It is not by votes, or favor, or purchase, that men rise to permanent distinction, but by merits earned through self-sacrifice and persistence, by a fire of enthusiasm that consumes all base things, and brings the man forth as pure gold.

And generals and captains,—commanding officers,—are made easier and cheaper in peace than in war. There is not as much risk, nor deprivation, nor jealousy. The rank and file are glad to help such, and their positions are more secure, remunerative and comfortable. We have them in the dental profession, and in every other profession and calling; men who continue to climb all the way along their journey from the beginning of their career. They continue to climb till they are the most conspicuous objects and geniuses of their sphere.

Young man, why not be a general, or at least a captain? Why not as well be a commander as one commanded? Why not be *the* dentist of your community as well as the second or third best? The great possibilities are before you, but they must be bought,—not with gold, but with work; work of muscle and brain; work and study that know no rest; work that shall so broaden the intellect and sharpen the skill that men shall willingly be your subjects.

The Dental Advertiser is grieved. For several years we have been pleased to quote from this journal. By an accident of our printer, we omitted *The Advertiser Journal* as the source of one article. This the editor of that journal thinks is unpardonable. Had we frequently offended before, it might be so; but we challenge another instance of such omission in all our quotations from his journal.

They asked their wisest man by what means he had attained to such a degree of knowledge. He replied: "Whatever I did not know I was not ashamed to inquire about."—*Persian Proverb.*

Complaints against the "Items."—Some of our contemporaries are sore-headed.

One complains that we take all the meat out of his journal. Well, we must confess that we have no use for the shell, or we would take that also. We read pretty thoroughly all the American and English dental journals to find their best thoughts; these we give to our readers.

Some complain that, in quoting from an article, we leave out much that is said. Yes; many writers do not seem to know where to begin, nor when to stop. The introduction is superfluous, and the ending a repetition, and in the body of the essay is much that is mere padding. We have not room for more than the main essential thought.

Then, again, some journals are jealous of their names being sometimes omitted from quotations. We do sometimes make mistakes; but we mean to give credit both to the writer and to the journal in which the writer is found, unless it is only a few sentences from extended remarks; then we only give the name of the writer.

Welsh Spelling.—Welsh spelling is much superior to the English. In fact it is almost perfect phonetics. This people are supposed to be ignorant, and yet in consequence of easy spelling there are few children in their teens who cannot read. How this should put to shame the proud Englishman? While the children of the latter were spending three of their best years learning to read, the Welsh child learns in a few days; and while English spelling is so difficult to learn that few Englishmen ever learn it thoroughly, the Welshmen are always correct spellers, because each letter represents a definite sound. England and the United States are the leading nations of the world in everything but their orthography; in this they are behind all other nations.

How to Empty a Carboy, barrel, or any other unwieldy vessel without handling it. Put into its bung or mouth a rubber cork with two holes for the insertion of glass tubes. They are to be found at any dental depot. Let one of the glass tubes be bent at the upper end so as to conveniently enter the bottle to be filled, and the other end passed through the cork to the bottom of the carboy or barrel. On the upper end of the other glass tube place a rubber tube for a mouth-piece. Now, by blowing into this latter tube, the extra air pressure in the vessel to be emptied will force out the liquor from the other tube into the bottle to be filled. You need not blow continuously. When the flow begins, compress the tube into which you have blown. If the flow slackens before your bottle is filled, repeat the blowing and compress as before.

A. W. HARLAN, M. D., D. D. S.

[See Frontispiece.]

Dr. Harlan is editor of *The Dental Review*, Chicago. He is just in the prime of his usefulness, though, judging from his career during the last few years, he has not attained the hight of his honors. He is rapidly progressive. His manly appearance, fine address, varied knowledge and exceptional skill, give him prominence in the profession as a writer, speaker, teacher and workman.

Platina in Amalgam.—Dr. Ames, in his paper on amalgam, in the Illinois Society, said that in the course of his experiments he had found amalgamated platina, though remaining indifferently plastic by itself, yet, when incorporated with other metals, imparted very desirable qualities, especially toughness and edge strength, its leathery nature being its main characteristic. Put a rod of iron into nitric acid, somewhat concentrated; the acid is rapidly decomposed, and the iron is as rapidly oxidized. Introduce a similar bar of iron into acid of the same strength, having a piece of platina in contact with it, letting the latter reach the acid in advance of the iron. No decomposition and no corrosion take place. Remove the little peace-maker, platina, and still all remains quiescent.

Oxygen is both a builder and a destroyer; it is essential to life, and a source of death. Like many other things it is a meat and it is a poison. As one of the constituents of the tissues of the body, it is the enemy of vital action, brought to them through the assimilation of food, and without which food could not be assimilated, so that food is largely valued by the degree in which it is rich in oxygen. But oxygen taken in by respiration is a fire. It burns the *debris* sent from the circulation to the lungs, to be cast out as smoke.

The President, who has been accustomed to use a glass of wine at dinner or semi-occasionally at other times, is said to have yielded to a request of Mrs. Cleveland, who desired to get the influence of his personal example to totally abandon the use of liquors. It is not every total abstainer, however, that has the sustaining influence of so exhilarating an atmosphere as Mrs. Cleveland creates.

It is reported that the dentists are taking the stump for revenue only all over the country. Politicians will have no patients with this sort of thing.

It is a pity that, in our short-sighted weakness, when one is able to lead in a certain scientific direction, he is in danger of regarding himself as a leader and guide in all directions; and he is a pretty good fellow if he does not become impatient when contradicted.

BOOK NOTICE.

We have just received from the publication office of the Welch Dental Co., of Philadelphia, "*The Student's Manual and Hand-Book for the Dental Laboratory*," by L. P. Haskell, of the Dental Department of the North-Western University. This is a little work in which is presented the very essence, in a practical aspect, of mechanical and prosthetic dentistry. It presents clearly and distinctly, though quite briefly every material point in regard to the laboratory with its complete outfit, together with all the materials required for preparing every kind of artificial substitute. It is very concise and definite in regard to modes and methods of procedure from the beginning to the end, giving that which is necessary, and nothing more. In it is presented very concisely the relative value of the different styles of artificial dentures. There is perhaps no one in the country better fitted for the preparation of such a work than Dr. Haskell. He brings to bear in its preparation the experience, exclusively in this line, of more than forty years. Dr. Haskell has been not only a most indefatigable worker, but he has been a close observer and a thorough experimenter as well, and we may safely say that no one has brought more out of this field of investigation than Dr. Haskell. This is one of the works that we feel safe in unqualifiedly recommending to every dental student, and every practitioner as well. It does not supercede nor take the place of larger works already in use, but it certainly fills a niche that has not before been occupied. It can be obtained through any bookseller, and of the dental depots —*Dental Register.*

The infirmary of the Missouri Dental College has been more than doubled in size to accommodate the increased attendance.

The next meeting of the National Association of Dental Examiners will be held in Louisville, Kentucky, on Monday evening, August 27th, at eight o'clock, and at other times, during the week, between the sessions of the American and Southern Dental Associations. It is important to have every State Board represented.

FRED. A. LEVY, D.D.S., Secretary.

The Baltimore College of Dental Surgery sends out its forty-ninth annual catalogue. It shows eighty two graduates at its last session, and with this college graduation means more than in some; for it is not only the oldest dental college, but one of the most thorough in its teachings.

Defrauding Dentists.—We receive still other complaints against F. T. Grimes, of St. Louis. They seem to come from intelligent dentists, too.

Miscellaneous.

DON'T UNDERVALUE THE BOY.

Too many men make their boys feel that they are too little or no account while they are boys. Lay a responsibility on a boy, and he will meet it in a manful spirit. On no account ignore their disposition to investigate. Help them to understand things. Encourage them to understand what they are about. We are too apt to treat a boy's seeking after knowledge as mere idle curiosity. "Don't ask questions" is poor advice to boys. If you do not explain puzzling things to them, you oblige them to make many experiments before they find out; and though experimental knowledge is best in one sense, in another it is not, for that which can be explained clearly does not need experimenting with. If the principle involved is understood, there is no further trouble, and the boy can go ahead intelligently.

Do not wait for the boy to grow up before you begin to treat him as an equal. A proper amount of confidence, and words of encouragement and advice, and give him to understand that you trust him in many ways, helps to make a man of him long before he is a man in either stature or years.

Give him tools, and let him find out for himself whether he has got any mechanical taste or not. Do not discourage him, as parents are apt to do, by saying, "Oh, it is no use for you to try to do anything with tools. I never have any taste that way, and of course you have not." If a boy finds he can make a few articles with his hand, it tends to make him rely on himself. And the planning that is necessary for the execution of the work is a discipline and an education of great value to him. The future welfare and happiness of the boy depends on the surroundings of his youth. When he arrives at that period in his life when he is obliged to choose what profession or what line of business to follow, it is highly important that he should take no false step. And if in his youth he has cultivated a taste for any particular branch, the choice of a profession or business will be made more easy.—*Architect and Building News.*

Arsenic, Applying to a Pulp.—There is no better way of applying arsenic to a pulp than to cut a piece of blotting paper the size required, dip it in oil of cloves, eucalyptus, eugenol or turpentine, touching it to finely powdered arsenic, and placing it over the pulp, cover with cotton where all the walls are intact, or with varnished cotton where the gum is in danger of being attacked.—*Southern Dental Journal.*

Blow Pipes.—A very neat and effective blow pipe can be made by attaching a piece of rubber tubing to the gasometer or cylinder of gas, using an ordinary mouth blow pipe attached thereto, the pressure of gas against the flame of an alcohol lamp makes a nice flame for soldering gold crowns, bands, etc. By this method dentists who do not have illuminating gas to use for such work, will find the above all that is desired.—DR. R. W. CHASE, in *Archives of Dentistry.*

The Use of Cements.—If oxyphosphate or chloride cements set too rapidly, add a little pulverized borax. This will retard the setting. If they set too slowly, warm the slab on which the cement is incorporated, or apply hot air after the insertion of the filling. After the cement is well set, yet before it is perfectly hard, apply a little soapstone, and with a heated burnisher thoroughly burnish the surface of the filling. It not only renders it denser, but produces a nicely polished surface.—*Ohio Journal Dental Science.*

Human Bite.—Physicians agree that the poison conveyed by human teeth is one of the most annoying that they have to deal with. One of them writes: "I have under my attention severe and most complicated cases of blood-poisoning, in which the patient had but slightly abraided the hand in the course of a fight by striking the knuckles against the teeth of his opponent. I have known hands thus poisoned only saved from amputation by the application of all the resources of science."—*Medical Register.*

Antiseptic Fluid.—The following will be found a most excellent antiseptic and surgical dressing:

℞	Bichloride of mercury	gr. iv
	Hydrate of chloral	ʒiv
	Muriate of ammonia	℈ij
	Distilled water	Ov

A slight sediment will appear in a few hours after the mixture has been compounded, but it is harmless. The fluid will remain clear indefinitely, and will he found one of the most convenient forms of fluid dressing.—*Medical Register.*

An Improved Container for Hypodermic Solutions.—Dr. F. A. Castle says: Instead of closing a phial, holding a solution for hypodermic use, with a stopper, draw over the orifice an India-rubber nursing bottle nipple without holes in its point. To fill the syringe, push the needle through the rubber, tip the phial bottom upward, and draw the desired amount of solution into the syringe. When the needle is withdrawn, the puncture in the rubber will close, and prevent either escape of solution or entrance of air. By properly sterilizing the solution and nipple, and using a clean needle, the solution will remain for a long time without change.

To Keep Syringes in Good Condition.—Dr. Frank Abbott says that syringes may be kept in perfect working order by drawing half full of water before laying away after using. The water will not evaporate, but remain in the syringe two or three, or perhaps six months, just as it is left.

Sharpening Corundum Wheels.—Place the wheel in a horizontal position, pour about a spoonful of alcohol on it, then using a stiff brush scrub the face of the wheel, lay it aside to dry thoroughly, and when used again it will be found nearly equal to a new one. This can be done as often as they get dull. Do not use them till thoroughly dry.